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NATURAL ESTABLISHMENT OF PINE IN ABANDONED FIELDS IN THE PIEDMONT REGION

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Forest tree planting in the Piedmont region of the southeastern states is being concentrated primarily on unforested, abandoned farm land, of which there are about 500,000 acres in North Carolina, South Carolina and Virginia. In the same three states there are perhaps 500,000 additional acres of abandoned farm land with a few pines starting, but in such open stands that, without marked increases in density, only forests of inferior quality will be produced.

As a rule, some pines appear on idle farm land in the Piedmont within 5 to 10 years after abandonment, though densities frequently are much too low for good stocking. Most strictly unforested land has been only recently abandoned, and eventually will display at least scattered stands of trees. This widespread prevalence of some reproduction, and the occasional occurrence of well-stocked stands strongly indicate that, under proper conditions, natural seeding can be relied upon to reforest abandoned fields. If those recently abandoned fields, or parts of fields, in which satisfactory natural stocking will appear can be recognized, the costs of planting trees on them can be saved.

A study was made to determine the places or conditions where satisfactory natural stocking is likely, and those where it is not likely, to take place. The results show that seed supply is the paramount factor affecting density of pine invasion into abandoned fields. Soil type, amount of erosion, topographic position, and type of herbaceous plant cover are of relatively minor importance, except in extremes, i.e., the sandiest soils, rapidly cutting gullies, the highest knolls and ridges, or the densest cover types.

Seed supply is contingent mainly on two factors: (1) characteristics or quality of the stand or trees serving as a seed source, and (2) distance from seed source. To facilitate evaluation of seed source quality, three classes are defined:

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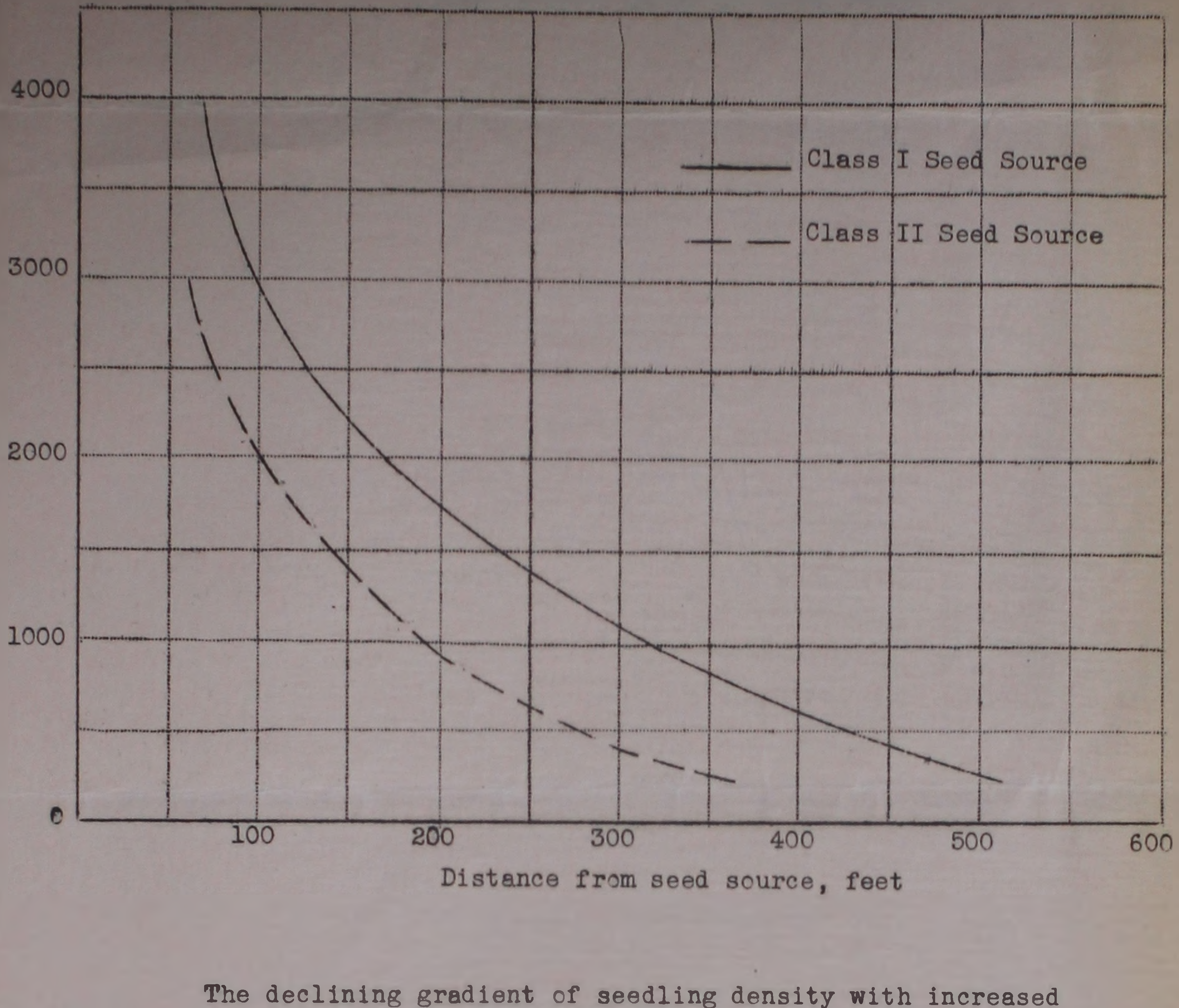
Class I Seed Source. A stand or the practical equivalent of a closed row of thrifty, vigorously growing trees, more than 40 years old, with well developed crowns, distributed along at least one entire side of the field to be supplied with seed.

Class II Seed Source. Distinctly inferior to Class I in seed-producing capacity. Usually represented either by stands satisfactorily distributed in relation to the fields they supply, but only 25 to 40 years old, or by trees of satisfactory age and vigor, but too few or poorly distributed - definitely less than the equivalent of a closed row along one entire side of the field. A few well distributed stands more than 40 years old may be poor seed producers and properly belong in Class II because of unthrifty growth.

Class III Seed Source. Includes all conditions in which seed production is scanty - usually represented by only a few scattered seed trees less than 40 years old, or by young stands 15 to 25 years old and just beginning to bear cones. A few older, fairly well distributed stands belong in Class III because of unthrifty growth, or because of location too far back from field boundaries. Class III seed sources are generally inadequate to produce satisfactory densities of reproduction except in the most favorable localized spots.

The effective seeding ranges for Class I and II seed sources are shown in the following figure. The curves are based on averages for fields with good reproduction, according to each seed source class. Nothing is shown for Class III fields because reproduction on them is too sparse and erratic in distribution to justify an attempt to locate a curve. The curves indicate that for Class I seed sources, 1,000 or more trees per acre can be expected to become established in adjacent abandoned fields to a distance of about 325 feet, and 500 trees per acre to a distance of about 425 feet; for Class II seed sources, the range for establishing these densities is slightly less than 200 feet and 300 feet, respectively.



The declining gradient of seedling density with increased distance from seed source for Seed Source Classes I and II.